MAQTQGTRRKVCYYYDGDVGNYYYGQGHPMKPHRIRMTHNLLLN

YGLYRKMEIYRPHKANAEEMTKYHSDDYIKFLRSIRPDNMSEYSKQMQRFNVGEDCPV

FDGLFEFCQLSTGGSVASAVKLNKQQTDIAVNWAGGLHHAKKSEASGFCYVNDIVLAI

LELLKYHQRVLYIDIDIHHGDGVEEAFYTTDRVMTVSFHKYGEYFPGTGDLRDIGAGK

GKYYAVYPLRDGIDDESYEAIFKPVMSKVMEMFQPSAVVLQCGSDSLSGDRLGCFNL

TIKGHAKCVEFVKSFNLPMLMLGGGGYTIRNVARCWTYETAVALDTEIPNELPYNDYF

EYFGPDFKLHISPSNMTNQNTNEYLEKIKQRLFENLRMLPHAPGVQMQAIPEDAIPEE

SGDEDEDDPDKRISICSSDKRIACEEEFSDSEEEGEGGRKNSSNFKKAKRVKTEDEKE

KDPEEKKEVTEEEKTKEEKPEAKGVKEEVKLA (SEQ ID NO:1)

FIG. 1A

```
   1 atgtctgggg tctctgcccg ctggtgctgc tgtctcccac tcggtcatcc tgagaacaca
  61 gcctgagcgr ctctgtcact cggggtagac cacgcgggga ggcgagcaag atggcgcaga
 121 cgcagggcac ccggaggaaa gtctgttact actacgacgg ggatgttgga aattactatt
 181 atggacaagg ccacccaatg aagcctcacc gaatccgcat gactcataat ttgctgctca
 241 actatggtct ctaccgaaaa atggaaatct atcgccctca caaagccaat gctgaggaga
 301 tgaccaagta ccacagcgat gactacatta aattcttgcg ctccatccgt ccagataaca
 361 tgtcggagta cagcaagcag atgcagagat tcaacgttgg tgaggactgt ccagtattcg
 421 atggcctgtt tgagttctgt cagttgtcta ctggtggttc tgtggcaagt gctgtgaaac
 481 ttaataagca gcagacggac atcgccgtga attgggctgg gggcctgcac catgcaaaga
 541 agtccgaggc atctggcttc tgttacgtca atgatatcgt cttggccatc ctggaactgc
 601 taaagtatca ccagagggtg ctgtacattg acattgatat tcaccatggt gacggcgtgg
 661 aagaggcctt ctacaccacg gaccgggtca tgactgtgtc ctttcataag tatggagagt
 721 acttcccagg aactggggac ctacgggata ccggggctgg caaagacaag tattatgctg
 781 ttaactaccc gctccgagac gggattgatg acgagtccta tgaggccatt ttcaagccgg
 841 tcatgtccaa agtaatggag atgttccagc ctagtgcggt ggtcttacag tgtggctcag
 901 actccctatc tggggatcgg ttaggttgct tcaatctatc tatcaaagga cacgccaagt
 961 gtgtggaatt tgtcaagagc tttaacctgc ctatgctgat gctgggaggc ggtggttaca
1021 ccattcgtaa cgttgcccgg tgctggacat atgagacagc tgtggccctg gatacggaga
1081 tccctaatga gcttccatac aatgactact ttgaatactt tggaccagat ttcaagctcc
1141 acatcagtcc ttccaatatg actaaccaga acacgaatga gtacctggag aagatcaaac
1201 agcgactgtt tgagaacctt agaatgctgc cgcacgcacc tggggtccaa acgcaggcga
1261 ttcctgagga cgccatccct gaggagagtg gcgatgagga cgaagacgac cctgacaagc
1321 gcatctcgat ctgctcctct gacaaacgaa ttgcctgtga ggaagagttc tccgattctg
1381 aagaggaggg agaggggggc cgcaagaact cttccaactt caaaaaagcc aagagagtca
1441 aaacagagga tgaaaaagag aaagacccag aggagaagaa aggaatcacc gaagaggaga
1501 aaaccaagga ggagaagcca gaagccaaag gggtcaagga ggaggccaag ttggcctgaa
1561 tggacctctc cagctctggc ttcctgctga gtccctcacg tttctttccc c (SEQ ID NO:2)
```

FIG. 1B

MAYSQGGGKKKCKVCYYYDGDIGNYYYGQGHPMKPHRIRMTHNLLL

NYGLYRKMEIYRPHKATAEEMTKYHSDEYIKFLRSIRPDNMSEYSKQMHIPFNVGEDCP

AFDGLFEFCQLSTGGSVAGAVKLNRQQTDMAVNWAGGLHHAKKYEASGFCYVNDIVLA

ILELLKYHQRVLYIDIDIHHRGDGVEEAFYTTDRVMTVSFYGEYFPGTGDLRDIGAG

KGKYYAVNFPMCDGIDDESYGQIFKPIISKVMEMYQPSAVVLQCGADSLSGDRLGCFN

LTVKGHAKCVEVVKTFNLPLLMLGGGGYTILRNVARCWTYETAVALDCEIPNELPYNDY

FEYFGPDFKLHISPSNMTNQNTPEYMEKIKQRLFENLRMLPHAPGVQMQAIPEDAVHE

DSGDEDGEDPDKRISIRASDKRIACDEEFSDSEDEGEGGRNVADHKKGAKARIEED

KKETEDKKTDVKEEDKSKDNSGEKTDTKGTKSEQLSNP (SEQ ID NO:3)

FIG. 2A

```
   1 cgccgagctt tcggcacctc tgccgggtgg taccgagcct tcccggcgcc ccctcctctc
  61 ctcccaccgg cctgcccttc cccgcgggac tatcgccccc acgtttccct cagccctttt
 121 ctctcccggc cgagccgcgg cggcagcagc agcagcagca gcagcaggag gaggagcccg
 181 gtggcggcgg tggccgggga gcccatggcg tacagtcaag gaggcggcaa aaaaaaagtc
 241 tgctactact acgacggtga tattggaaat tattattatg gacagggtca tcccatgaag
 301 cctcatagaa tccgcatgac ccataacttg ctgttaaatt atggcttaca cagaaaaatg
 361 gaaatatata ggccccataa agccactgcc gaagaaatga caaaatatca cagtgatgag
 421 tatatcaaat ttctacggtc aataagacca gataacatgt ctgagtatag taagcagatg
 481 catatattta atgttggaga agattgtcca gcgtttgatg gactctttga gttttgtcag
 541 ctctcaactg gcggttcagt tgctggagct gtgaagttaa accgacaaca gactgatatg
 601 gctgttaatt gggctggagg attacatcat gctaagaaat acgaagcatc aggatcctgt
 661 tacgttaatg atattgtgct tgccatcctt gaattactaa agtatcatca gagagtctta
 721 tatatcgata tagatattca tcatggtgat ggtgtcgaag aagcttttta tacaacagat
 781 cgtgtaatga cggtatcatt ccataaatat ggggaatact ttcctggcac aggagacttg
 841 agggatattg gtgctggaaa aggcaaatac tatgctgtca attttccaat gtgtgatggt
 901 atagacgatg agtcatatgg gcagatattt aagcctatta tctcaaaggt gatggagatg
 961 tatcaaccta gtgctgtggt attacagtgt ggtgcagact cattatctgg tgatagactg
1021 ggttgtttca atctaacagt caaaggtcat gctaaatgtg tagaagttgt aaaaactttt
1081 aacttaccat tactgatgct tggaggaggt ggctacacaa tccgtaatgt tgctcgatgt
1141 tggacatatg agactgcagt tgcccttgat tgtgagattc ccaacgagtt gccatataat
1201 gattactttg agtattttgg accagacttc aaactgcata ttagtccttc aaacatgaca
1261 aaccagaaca ctccagaata tacggaaaag ataaaacagc gtttgtttga aaatttgcgc
1321 atgttacctc atgcacctgg tgtccagatg caagctattc cagaagatgc tgttcatgaa
1381 gacagtggag atgaagatgg agaagatcca gacaagagaa tttctattcg agcatcagac
1141 aagcggatag cttgtgatga agaattctca gattctgagg atgaaggaga aggaggtcga
1501 agaaatgtgg ctgatcataa gaaaggagca aagaaagcta gaattgaaga agataagaaa
1561 gaaacagagg acaaaaaaac agacgttaag gaagaagata aatccaagga caacagtggt
1621 gaaaaaacag ataccaaagg aaccaaatca gaacagctca gcaacccctg aatctgacag
1681 tctcaccaat ttcagaaaat cattaaaaag aaaatattga aaggaaaatg ttttcttttt
1741 gaagacttct ggcttcattt tatactactt tggcatggac tgtatttatt ttcaaatggg
1801 actttttcgt ttttgttttt ctgggcaagt tttattgtga gattttctaa ttatgaagca
1861 aaatttcttt tctccaccat gctttatgtg atagtattta aaattgatgt gagttattat
1921 gtcaaaaaaa ctgatctatt aaagaagtaa ttggcctttc tgagctgaaa aaaaaaaaaa
1981 aaaag (SEQ ID NO:4)
```

FIG. 2B

09812913.043001

MAKTVAYFYDPDVGNFHYGAGHPMKPHRLALTHSLVLHYGLYKK

MIVFKPYQASQHDMCRFHSEDYIDFLQRVSPTNMQGFTKSLNAPNVGDDCPVFPGLFE

FCSRYTGASLQGATQLNNKICDIANWAGGLHHAKKFEASGFCYVNDIVIGILELLLKY

HPRVLYIDIDIHHGDGVQEAFYLTDRVMTVSFHKYGNYFFPGTGDMYEVGAESGRYYC

LNVPLRDGIDDQSYKHLFQPVINQVVDFYQPTCIVLQCGADSLGCDRLGCFNLSIRGH

CECVEYVKSFNIPPLLVLGGGGYTVRNVARCWTYETSLLVEEAISEELPYSEYFEYFAP

DFTLHPDVSTRIENQSRQYLDQIRQTIFENLKMLNHAPSVQIHDVPADLLTYDRTDE

ADAEERGPEENYSRPEAPNEFYDGDHDNDKESDVEI (SEQ ID NO:5)

FIG. 3A

```
   1 ggaattcgcg gccgcggcgg gcgcgggagg tgcggggcct gctcccgccg gcaccatggc
  61 caagaccgtg gcctatttct acgaccccga cgtgggcaac ttccactacg gagctggaca
 121 ccctatgaag ccccatcgcc tggcattgac ccatagcctg gtcctgcatt acggtctcta
 181 taagaagatg atcgtcctca agccatacca ggcctcccaa catgacatgt gccgcttcca
 241 ctccgaggac tacattgact tcctgcagag agtcagcccc accaatatgc aaggcttcac
 301 caagagtctt aatgccttca acgtaggcga tgactgccca gtgtttcccg ggctctttga
 361 gttctgctcg cgttacacag gcgcatctct gcaaggagca acccagctga acaacaagat
 421 ctgtgatatt gccattaact gggctggtgg tctgcaccat gccaagaagt ttgaggcctc
 481 tggcttctgc tatgtcaacg acattgtgat tggcatcctg gagctgctca agtaccaccc
 541 tcgggtgctc tacattgaca ttgacatcca ccatggtgac ggggttcaag aagctttcta
 601 cctcactgac cgggtcatga cggtgtcctt ccacaaatac ggaaattact tcttccctgg
 661 cacaggtgac atgtatgaag tcggggcaga gagtggccgc tactactgtc tgaacgtgcc
 721 cctgcgggat ggcattgatg accagagtta caagcacctt ttccagccgg ttatcaacca
 781 ggtagtggac ttctaccaac ccacgtgcat tgtgctccag tgtggagctg actctctggg
 841 ctgtgatcga ttgggctgct ttaacctcag catccgaggg catggggaat gcgttgaata
 901 tgtcaagagc ttcaatatcc ctctactcgt gctgggtggt ggtggttata ctgtccgaaa
 961 tgttgcccgc tgctggacat atgagacatc gctgctggca gaagaggcca ttagtgagga
1021 gcttccctat agtgaatact tcgagtactt tgccccagac ttcacacttc atccagatgt
1081 cagcacccgc atcgagaatc agaactcacg ccagtatctg gaccagatcc gccagacaat
1141 ctttgaaaac ctgaagatgc tgaaccatgc acctagtgtc cagattcatg acgtgcctgc
1201 agacctcctg acctacgaca ggaccgatga ggccgatgca gaggagaggg gtcctgagga
1261 gaactatagc aggccagagg catccaatga gttctatgat ggagaccatg acaatgacaa
1321 ggaaagcgat gtggagattt aagagtggct tgggatgctg tgtcccaagg aatttctttt
1381 cacctcttgg aagggctgga gggaaaagga gtggctccta gagtcctggg ggtcacccca
1441 ggggcttttg ctgactctgg gaaagagtct ggagaccaca tttggttctc gaaccatcta
1501 cctgcttttc ctctctctcc caaggactga caatggtacc tattagggat gagatacaga
1561 caaggatagc tatctgggac attattggca gtgggccctg gaggcagtcc ctagcccccc
1621 ttgcccctta tttcttccct gcttccctcg aacccagaga tttttgaggg atgaacgggt
1681 agacaaggac tgagattgcc tctgacttcc tcctcccctg ggttctgacc ttcttcctcc
1741 ccttgcttcc agggaagatg aagagagaga gatttggaag gggctctggc tccctaacac
1801 ctgaatccca gatgatggga agtatgtttt caagtgtggg gaggatatga aaatgttctg
1861 ctctcacttt tggctttatg tccattttac cactgttttt atccaataaa ctaagtcggt
1921 atttttgta  cctttgatgg tttagcggcc gcgc (SEQ ID NO:6)
```

FIG. 3B

MLAMKHQQELLEHQRKLERHRQEQELEKQHREQKLQQLKNKEKG

KESAVASTEVKMKLQEFVLNKKKALAHPNLNHCISSCPRYWYGKTQHSSLDQSSPPQS

GVSTSYNHPVLGMYDAKDDFPLRKTASEPNLKLRSRLKQKVAERRSSPLLRRKDGPVV

TALKKRPLDVTDSACSSAPGSGPSSPNNSSGSVSAENGIAPAVPSIPAETSLAHRLVA

REGSAAPLPLYTSPSLPNITLGLPATGPSAGTAGQQDTERLTLPALQQRLSLFPGTHL

TPYLSTSPLERDGGAAHSPLLQHMVLLEQPPAQAPLVTGLGALPLHAQSLVGADRVSP

SIHKLRQHRPLGRTQSAPLPQNAQALQHLVIQQQHQQFLEKHKQQFQQQQLQMNKIIP

KPSEPARQPESHPEETEEELREHQALLDEPYLDRLPGQKEAHAQAGVQVKQEPIESDE

EEAEPPREVEPGQRQPSEQELLFRQQALLLEQQRIHQLRNYQASMEAAGIPVSFGGHR

PLSRAQSSPASATFPVSVQEPPTKPRFTTGLVYDTLMLKHQCTCGSSSSHPEHAGRIQ

SIWSRLQETGLRGKCECIRGRKATLEELQTVHSEAHTLLYGTNPLNRQKLDSKKLLGS

LASVFVRLPCGGVGVDSDTIWNEVHSAGAARLAVGCVVELVFKVATGELKNGFAVVRP

PGHHAEESTPMGFCYFNSVAVAAKLLQQRLSVSKILIVDWDVHHGNGTQQAFYSDPSV

LYMSLHRYDDGNFFPGSGAPDEVGTGPGVGFNVNMAFTGGLDPPMGDAEYLAAFRTVV

MPIASEFAPDVVLASSGFDAVEGHPTPLGGYNLSARCFGYLTKQLMGLAGGRIVLALE

GGHDLTAICDASEACVSALLGNELDPLPEKVLQQRPNANAVRSMEKVMEIHSKYWRCL

QRTTSTAGRSLIEAQTCENEEAETVTAMASLSVGVKPAEKRPDEEPMEEEPPL (SEQ ID NO:7)

FIG. 4A

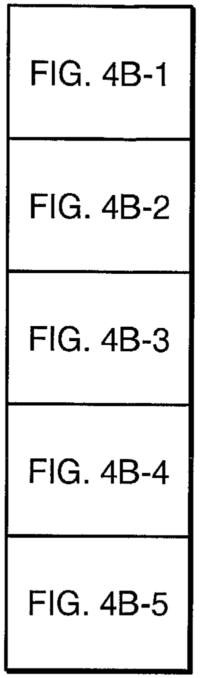


FIG. 4B

```
  1 ggagqttgtg gggccgccgc cgcggagcac cgtccccgcc gccgcccgag cccgagcccg
 61 agcccgcgca cccgcccgcg ccgccgccgc cgccgcccga acagcctccc agcctgggcc
121 cccggcggcg ccgtggccgc gtcccggctg tcgccgcccg agcccgagcc cgcgcgccgg
181 cgggtggcgg cgcaggctga ggagatgcgg cgcggagcgc cggagcaggg ctagagccgg
241 ccgccgccgc ccgccgcggt aagcgcagcc ccggcccggc gcccgcgggc cattgtccgc
301 cgcccgcccc gcgccccgcg cagcctgcag gccttggagc ccgcggcagg tggacgccgc
361 cggtccacac ccgccccgcg cgcggccgtg ggaggcgggg gccagcgctg gccgcgcgcc
421 gtgggacccg ccggtcccca gggccgcccg gccccttctg gacctttcca cccgcgccgc
491 gaggcggctt cgcccgccgg ggcgggggcg cgggggtggg cacggcaggc agcggcgccg
541 tctcccggtg cggggcccgc gcccccgag caggttcatc tgcagaagcc agcggacgcc
601 tctgttcaac ttgtgggtta cctggctcat gagaccttgc cggcgaggct cggcgcttga
661 acgtctgtga cccagccctc accgtcccgg tacttgtatg tgttggcggg agtttggagc
721 tcgttggagc tatcgtttcc gtggaaattt tgagccattt cgaatcactt aaaggagtgg
781 acattgctag caatgagctc ccaaagccat ccagatggac tttctggccg agaccagcca
841 gtggagctgc tgaatcccgc ccgcgtgaac cacatgccca gcacggtgga tgtggccacg
901 gcgctgcctc tgcaagtggc ccccccggca gegcccatgg acccgcgcct ggaccaccag
961 ttctcactgc ctgtggcaga gccggccctg cgggagcagc agctgcagca ggagctcctg
```

FIG. 4B-1

```
1021 gcgctcaagc agaagcagca gatccagagg cagatcctca tcgccgagtt ccagaggcag
1081 cacgagcagc tctcccggca gcacgaggcg cagctccacg agcacatcaa gcaataacag
1141 gagatgctgg ccatgaagca ccagcaggag ctgctggaac accagcggaa gctggagagg
1201 caccgccagg agcaggagct ggagaagcag caccgggagc agaagctgca gcagctcaag
1261 aacaaggaga agggcaaaga gagtgccgtg gccagcacag aagtgaagat gaagttacaa
1321 gaatttgtcc tcaataaaaa gaaggcgctg gcccaccgga atctgaacca ctgcacttcc
1381 agagaccctc gctactggta cgggaaaacg cagcacagtt cccttgacca gagttctcca
1441 ccccagagcg gagtgtcgac ctcctataac cacccggtcc tgggaatgta cgacgccaaa
1501 gatgacttcc ctcttaggaa aacagcttct gaaccgaatc tgaaatcacg gtccaggcta
1561 aagcagaaag tggccgaaag acggagcagc cccctgttac gcaggaaaga cgggccagtg
1621 gtcactgctc taaaaaagcg tccgttggat gtcacagact ccgcgtgcag cagcgcccca
1681 ggctccggac ccagctcacc caacaacagc tccgggagcg tcgcgtggag gaacggtatc
1741 gcgcccgccg tccccagcat cccggcggag acgagtttgg cgcacagact tgtggcacga
1801 gaaggctcgg ccgctccact tcccctctac acatcgccat ccttgcccaa catcacgctg
1861 ggcctgcctg ccaccggccc ctctgcgggc acggcgggcc agcaggacac cgagagactc
1921 acccttcccg ccctccagca gaggctctcc cttttccccg gcacccacct cactccctac
1981 ctgagcacct cgcccttgga gcgggacgga ggggcagcgc acagccctct tctgcagcac
2041 atggtcttac tggagcagcc accggcacaa gcacccctcg tcacaggcct gggagtactg
2101 cccctccacg cacagtcctt ggttggtgca gaccgggtgt cccctccat ccacaagctg
2161 cggcagcacc gcccactggg gcggacccag tcggccccgc tgccccagaa cgcccaggct
2221 ctgcagcacc tggtcatcca gcagcagcat cagcagtttc tggagaaaca caagcagcag
2281 ttccagcagc agcaactgca gatgaacaag atcatcccca agccaagcga gccagcccgg
2341 cagccggaga gccacccgga ggagacggag gaggagctcc gtgagcacca ggctctgctg
2401 gacgagccct acctggaccg gctgccgggg cagaaggagg cgcacgcaca ggccggcgtg
2461 caggtgaagc aggagcccat tgagagcgat gaggaagagg cagagccccc acgggaggtg
2521 gagccgggcc agcgccagcc cagtgagcag gagctgctct tcagacagca agccctcctg
2581 ctggagcagc agcggatcca ccagctgagg aactaccagg cgtccatgga ggccgccggc
2641 atccccgtgt ccttcggcgg ccacaggcct ctgtcccggg cgcagtcctc acccgcgtct
2701 gccaccttcc ccgtgtccgt gcaggagccc cccaccaagc cgaggttcac gacaggcctc
2761 gtgtatgaca cgctgatgct gaagcaccag tgcacctgcg ggagtagcag cagccacccc
2821 gagcacgccg ggaggatcca gagcatctgg tcccgcctgc agaagacggg cctccggggc
```

FIG. 4B-2

T00E40"ET6ZT860

```
2881 aaatgcgagt gcatccgcgg acgcaaggcc accctggaag agctacagac ggtgcactcg
2941 gaagcccaca ccctcctgta tggcacgaac cccctcaacc ggcagaaact ggacagtaag
3001 aaacttctag gctcgctcgc ctccgtgttc gtccggctcc cttgcggtgg tgttggggtg
3061 gacagtgaca ccatatggaa cgaggtgcac tcggcgggggcagcccgcct ggctgtgggc
3121 tgcgtggtag agctggtctt caaggtggcc acaggggagc tgaaaaatgg ctttgctgtg
3181 gtccgccccc ctggacacca tgcggaggag agcacgccca tgggcttttg ctacttcaac
3241 tccgcggccg tggcagccaa gcttctgcag cagaggttga gcgtgagcaa gatcctcatc
3301 gtggactggg acgtgcacca tggaaacggg acccagcagg ctttctacag cgaccctagc
3361 gtcctgtaca tgtccctcca ccgctacgac gatgggaact tcttcccagg cagcggggct
3421 cctgatgagg tgggcacagg gcccggcgtg ggtttcaacg tcaacacggc tttcaccggc
3481 ggcctggacc cccccatggg agacgctgag tacttggcgg ccttcagaac ggtggtaatg
3541 ccgatcgcca gcgagtttgc cccggatgtg gtgctggtgt catcaggctt cgatgccgtg
3601 gagggccacc ccacccctct tgggggctac aacctctccg ccagatgctt cgggtacctg
3661 acgaagcagc tgatgggcct ggctggcggc cggattgtcc tggccctcga gggaggccac
3721 gacctgaccg ccatttgcga cgcctcggaa gcatgtgttt ctgccttgct gggaaacgag
3781 cttgatcctc tcccagaaaa ggttttacag caaagaccca atgcaaacgc tgtccgttcc
3841 atggagaaag tcatggagat ccacagcaag tactggcgct gcctgcagcg cacaacctcc
3901 acagcggggc gttctctgat cgaggctcag acttgcgaga acgaagaagc cgagacggtc
3961 accgccatgg cctcgctgtc cgtggacgtg aagcccgccg aaaagagacc agatgaggag
4021 cccatggaag aggagccgcc cctgtagcac tccctcgaag ctgctgttct cttgtctgtc
4081 tgtctctgtc ttgaagctca gccaagaaac tttcccgtgt cacgcctgcg tcccaccgtg
4141 gggctctctt ggagcaccca gggacaccca gcgtgcaaca gccacgggaa gcctttctgc
4201 cgcccaggcc cacaggtctc gagacgcaca tgcacgcctg ggcgtggcag cctcacaggg
4261 aacacgggac agacgccggc gacgcgcaga cacacggaca cgcggaagcc aagcacactc
4321 tggcgggtcc cgcaagggac gccgtggaag aaaggagcct gtggcaacag gcggccgagc
4381 tgccgaattc agttgacacg aggcacagaa aacaaatatc aaagatctaa taatacaaaa
4441 caaacttgat taaaactggt gcttaaagtt tattacccac aactccacag tctctgtgta
4501 aaccactcga ctcatcttgt agcttatttt tttttaaag aggacgtttt ctacggctgt
4561 ggcccgcctc tgtgaaccat agcggtgtgc ggcgggggt ctgcacccgg gtgggggaca
4621 gagggacctt taaagaaaac aaaactggac agaaacagga atgtgagctg gggagctgg
4681 cttgagtttc tcaaaagcca tcggaagatg cgagtttgtg cctttttttt tattgctctg
```

FIG. 4B-3

```
4741 gtggattttt gtggctgggt tttctgaagt ctgaggaaca atgccttaag aaaaaacaaa
4801 cagcaggaat cggtgggaca gtttcctgtg gccagccgag cctggcagtg ctggcaccgc
4861 gagctggcct gacgcctcaa gcacgggcac cagccgtcat ctccggggcc aggggctgca
4921 gcccggcggt ccctgttttg ctttattgct gtttaagaaa aatggaggta gttccaaaaa
4981 agtggcaaat cccgttggag gttttgaagt ccaacaaatt ttaaacgaat ccaaagtgtt
5041 ctcacacgtc acatacgatt gagcatctcc atctggtcgt gaagcatgtg gtaggcacac
5101 ttgcagtgtt acgatcggaa tgctttttat taaaagcaag tagcatgaag tattgcttaa
5161 attttaggta taaataaata tatatatgta taatatatat tccaatgtat tccaagctaa
5221 gaaacttact tgattcttat gaaatcttga taaaatattt ataatgcatt tatagaaaaa
5281 gtatatatat atatataaaa tgaatgcaga ttgcgaaggt ccctgcaaat ggatggcttg
5341 tgaatttgct ctcaaggtgc ttatggaaag ggatcctgat tgattgaaat tcatgttttc
5401 tcaagctcca gattggctag atttcagatc gccaacacat tcgccactgg gcaactaccc
5461 tacaagtttg tactttcatt ttaattattt tctaacagaa ccgctcccgt ctccaagcct
5521 tcatgcacat atgtacctaa tgagttttta tagcaaagaa tataaatttg ctgttgattt
5561 ttgtatgaat tttttcacaa aaagatcctg aataagcatt gttttatgaa ttttacattt
5641 ttcctcacca tttagcaatt ttccgaatgg taataatgtc taaatctttt tcctttctga
5701 attcttgctt gtacattttt ttttaccttt caaaggtttt taattatttt tgtttttatt
5761 tttgtacgat gagttttctg cagcgtacag aattgttgct gtcagattct attttcagaa
5821 agtgagagga gggaccgtag gtcttttcgg agtgacacca acgattgtgt ctttcctggt
5881 ctgtcctagg agctgtataa agaagcccag gggctctttt taactttcaa cactagtagt
5941 attacgaggg gtggtgtgtt tttcccctcc gtggcaaggg cagggagggt tgcttaggat
6001 gcccggccac cctgggaggc ttgccagatg ccgggggcag tcagcattaa tgaaactcat
6061 gtttaaactt ctctgaccac atcgtcagga tagaattcta acttgagttt tccaaacacc
6121 ttttgagcat gtcagcaatg catggggcac acgtggggct ctttacccac ttgggttttt
6181 ccactgcagc cacgtggcca gccctggatt ttggagcctg tggctgcaag gaacccaggg
6241 acccttgttg cctggtgaac ctgcagggag ggtatgattg cctgaccagg acagccagtc
6301 tttactcttt ttctcttcaa cagtaactga cagtcacgtt ttactggtaa cttattttcc
6361 agcacatgaa gccaccagtt tcattccaaa gtgtatattg ggttcagact tgggggcaga
6421 agttcagaca caccgtgctc aggagggacc cagagccgag tttcggagtt tggtaaagtt
6481 tacagggtag cttctgaaat taactcaaac ttttgaccaa atgagtgcag attcttggat
6541 tcacttggtc actgggctgc tgatggtcag ctctgagaca gtggtttgag agcaggcaga
```

FIG. 4B-4

```
6601 acggtcttgg gacttgtttg actttcccct ccctggtggc cactctttgc tctgaagccc
6661 agattggcaa gaggagctgg tccattcccc attcatggca cagaacagtg gcagggccca
6721 gctagcaggc tcttctggcc tccttggcct cattctctgc atagccctct ggggatcctg
6781 ccacctgccc tcttaccccg ccgtggctta tggggaggaa tgcatcatct cacttttttt
6841 ttttaagcag atgatgggat aacatggact gctcagtggc caggttatca gtgggggggac
6901 ttaattctaa tctcattcaa atggagacga cctctgcaaa ggcctggcag ggggaggcaa
6961 gtttcatctg tcagctcact ccagcttcac aaatgtgctg agagcattac tgtgtagcct
7021 tttctttgaa gacacactcg gctcttctcc acagcaagcg tccagggcag atggcagagg
7081 atctgcctcg gcgtctgcag gcgggaccac gtcagggagg gttccttcat gtgttctccc
7141 tgtgggtcct tggaccttta gccttttcct tcctttgcaa aggccttggg ggcactggct
7201 gggagtcagc aagcgagcac tttatatccc tttgagggaa accctgatga cgccactggg
7261 cctcttggcg tctgacctgc cctcgccgct tcccgccgtg ccgcagcgtg cccacgtgcc
7321 cacgccccac cagcaggcgg ctgccccgga ggccgtggcc cgctgggact ggccgcccct
7381 ccccagcgtc ccagggctct ggttctggag ggccactttg tcaaggtgtt tcagtttttc
7441 tttacttctt ttgaaaatct gtttgcaagg ggaaggacca tttcgtaatg gtctgacaca
7501 aaagcaagtt tgatttttgc agcactagca atggactttg ttgcttttct ttttgatcag
7561 aacattcctt ctttactggt cacagccacg tgctcattcc attcttcttt ttgtagactt
7621 tgggcccacg tgttttatgg gcattgatac atatataaat atatagatat aaatatatat
7681 gaatacattt ttttaagttt cctacacctg gaggttgcat ggactgtacg accggcatga
7741 ctttatattg tatacagatt ttgcacgcca aactcggcag ctttggggaa gaagaaaaat
7801 gcctttctgt tcccctctca tgacatttgc agatacaaaa gatggaaatt tttctgtaaa
7861 acaaaacctt gaaggagagg agggcgggga agtttgcgtc ttattgaact tattcttaag
7921 aaattgtact ttttattgta agaaaaataa aaaggactac ttaaacattt gtcatattaa
7981 gaaaaaaagt ttatctagca cttgtgacat accaataata gagtttattg tatttatgtg
8041 gaaacagtgt tttagggaaa ctactcagaa ttcacagtga actgcctgtc tctctcgagt
8101 tgatttggag gaattttgtt ttgttttgtt ttgtttgttt ccttttatct ccttccacgg
8161 gccaggcgag cgccgcccgc cctcactggc cttgtgacgg tttattctga ttgagaactg
8221 ggcggactcg aaagagtccc cttttccgca cagctgtgtt gactttttaa ttacttttag
8281 gtgatgtatg gctaagattt cactttaagc agtcgtgaac tgtgcgagca ctgtggttta
8341 caattatact ttgcatcgaa aggaaaccat ttcttcattg taacgaagct gagcgtgttc
8401 ttagctcggc ctcactttgt ctctggcatt gattaaaagt ctgctattga aagaaaaag(SEQ ID NO:8)
```

FIG. 4B-5

LRQGGTLTGKFMSTSSIPGCLLGVALEGDGSPHGHASLLQHVLL

LEQARQQSTLIAVPLHGQSPLVTGERVATSMRTVGKLPRHRPLSRTQSSPLPQSPQAL

QQLVMQQQHQQFLEKQKQQQLQLGKILTKTGELPRQPTTHPEETEEELTEQQEVLLGE

GALTMPREGSTESESTQEDLEEEDEEEDGEEEDCIQVKDEEGESGAEEGPDLEEPGA

GYKKLFSDAQPLQPLQVYQAPLSLATVPHQALGRTQSSPAAPGGMKSPPDQPVKHLFT

TGVVYDTFMLKHQCMCGNTHVHPEHAGRIQSIWSRLQETGLLSKCERIRGRKATLDEI

QTVHSEYIHTLLYGTSPLNRQKLDSKKLLGPISQKMYAVLPCGGIGVDSDTVWNEMHSS

SAVRMAVGCLLELAFKVAAGELKNGFAIIRPPGHHAEESTAMGFCFFNSVAITAKLLQ

QKLNVGKVLIVDWDIHHGNGTQQAFYNDPSVLYISLHRYDNGNFFPGSGAPEEVGGGP

GVGYNVNVAWTGGVDPPIGDVEYLTAFRTVVMPIAHEFSPDVVTLVSAGFDAVEGHLSP

LGGYSVTARCFGHLTRQLMTLAGGRVVLALEGGHDLTAICDASEACVSALLSVELQPL

DELVLQQKPNINAVATLEKVIETQSKHWSCVQKFAAGLGRSLREAQAGETEEAETVSA

MALLSVGAEQAQAAAAREHSPRPAEEPMEQEPAL (SEQ ID NO:9)

FIG. 5A

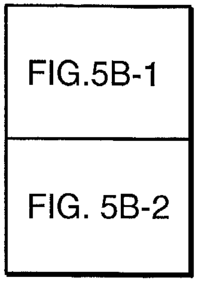


FIG. 5B

```
  1 ccctgcggca gggtggcacg ctgaccggca agttcatgag cacatcctct attcctggct
 61 gcctgctggg cgtggcactg gagggcgacg ggagccccca cgggcatgcc tccctgctgc
121 agcatgtgct gttgctggag caggcccggc agcagagcac cctcattgct gtgccactcc
181 acgggcagtc cccactagtg acgggtgaac gtgtggccac cagcatgcgg acggtaggca
241 agctcccgcg gcatcggccc ctgagccgca ctcagtcctc accgctgccg cagagtcccc
301 aggccctgca gcagctggtc atgcaacaac agcaccagca gttcctggag aagcagaagc
361 agcagcagct acagctgggc aagatcctca ccaagacagg ggagctgccc aggcagccca
421 ccacccaccc tgaggagaca gaggaggagc tgacggagca gcaggaggtc ttgctggggg
481 agggagccct gaccatgccc cgggagggct ccacagagag tgagagcaca caggaagacc
541 tggaggagga ggacgaggaa gaggatgggg aggaggagga ggattgcatc caggttaagg
601 acgaggaggg cgagagtggt gctgaggagg ggcccgactt ggaggagcct ggtgctggat
661 acaaaaaact gttctcagat gcccagccgc tgcagccttt gcaggtgtac caggcgcccc
721 tcagcctggc cactgtgccc caccaggccc tgggccgtac ccagtcctcc cctgctgccc
781 ctggggggcat gaagagcccc ccagaccagc ccgtcaagca cctcttcacc acaggtgtgg
841 tctacgacac gttcatgcta aagcaccagt gcatgtgcgg gaacacacac gtgcaccctg
```

FIG. 5B-1

```
 901 agcatgctgg ccggatccag agcatctggt cccggctgca ggagacaggc ctgcttagca
 961 agtgcgagcg gatccgaggt cgcaaagcca cgctagatga gatccagaca gtgcactctg
1021 aataccacac cctgctctac gggaccagtc ccctcaaccg gcagaagcta gacagcaaga
1081 agttgctcgg ccccatcagc cagaagatgt atgctgtgct gccttgtggg ggcatcgggg
1141 tggacagtga caccgtgtgg aatgagatgc actcctccag tgctgtgcgt atggcagtgg
1201 gctgcctgct ggagctggcc ttcaaggtgg ctgcaggaga gctcaagaat ggatttgcca
1261 tcatccggcc cccaggacac cacgccgagg aatccacagc cacgggattc tgcttcttca
1321 actctgtagc catcaccgca aaactcctac agcagaagtt gaacgtgggc aaggtcctca
1381 tcgtggactg ggacattcac catggcaatg gcacccagca ggcgttctat aatgacccct
1441 ctgtgctcta catctctctg catcgctatg acaacgggaa cttctttcca ggctctgggg
1501 ctcctgaaga ggttggtgga ggaccaggcg tggggtacaa tgtgaacgtg gcatggacag
1561 gaggtgtgga cccccccatt ggagacgtgg agtaccttac agccttcagg acagtggtga
1621 tgcccattgc ccacgagttc tcacctgatg tggtcctagt ctccgccggg tttgatgctg
1681 ttgaaggaca tctgtctcct ctgggtggct actctgtcac cgccagatgt tttggccact
1741 tgaccaggca gctgatgacc ctggcagggg gccgggtggt gctggccctg gagggaggcc
1801 atgacttgac cgccatctgt gatgcctctg aggcttgtgt ctcggctctg ctcagtgtag
1861 agctgcagcc cttggatgag gcagtcttgc agcaaaagcc caacatcaac gcagtggcca
1921 cgctagagaa agtcatcgag atccagagca aacactggag ctgtgtgcag aagttcgccg
1981 ctggtctggg ccggtccctg cgagaggccc aagcaggtga ggccgaggag gccgagactg
2041 tgagcgccat ggccttgctg tcggtggggg ccgagcaggc ccaggctgcg gcagcccggg
2101 aacacagccc caggccggca gaggagccca tggagcagga gcctgccctg tgacgccccg
2161 gcccccatcc ctctcggctt caccattgtg attttgttta ttttttctat taaaaacaaa
2221 aagtcacaca ttc (SEQ ID NO:10)
```

FIG. 5B-2

```
   1 mtstgqdstt trqrrsrqnp qsppqdssvt skrnikkgav prsipnlaev kkkgkmkklg
  61 qameedlivg lqgmdlnlea ealagtglvl deqlnefhcl wddsfpegpe rlhaikeqli
 121 qeglldrcvs fqarfaekee lmlvhsleyi dlmettqymn egelrvladt ydsvylhpns
 181 yscaclasgs vlrlvdavlg aeirngmaii rppghhaqhs lmdgycmfnh vavaaryaqq
 241 khrirrvliv dwdvhhgqgt qftfdqdpsv lyfsihryeq grfwphlkas nwsttgfgqg
 301 qgytinvpwn qvgmrdadyi aaflhvllpv alefqpqlvl vaagfdalqg dpkgemaatp
 361 agfaqlthll mglaggklil sleggynira laegvsaslh tllgdpcpml espgapcrsa
 421 qasvscalea lepfwevlvr stetverdnm eednveesee egpweppvlp iltwpvlqsr
 481 tglvydqnmm nhcnlwdshh pevpqrilri morleelgia grcltitprp ateaelltch
 541 saeyvghlra tekmktrelh ressnfdsiy icpstfacaq Iatgaacrlv eavisgevin
 601 gaavvrppgh haeqdaacgf cffnsvavaa rhaqtisgha lrilivdwdv hhgngtqhmf
 661 eddpsvlyvs lhrydhgtff pmgdegassq igraagtgft vnvawngprm gdadylaawh
 721 rlvlpiayef npelvlvsag fdaargdplg gcqvspegya hlthllmgla sgriilileg
 781 gynltsises maactrsilg dppplltlpr pplsgalasi tetiqvhrry wrslrvmkve
 841 dregpssskl vtkkapqpak prlaermttr ekkvleagmg kvtsasfgee stpgqtnset
 901 avvalcqdqp seaatggatl aqtiseaaig gamlgqttse eavggatpdq ttseetvgga
 961 ildqttseda vggatigqtt seeavggatl aqtiseaame gatldqttse eapggteliq
1021 tplasstdhq tpptspvqgt tpqispstli gslrtlelgs esqgasesqa pgeenllgea
1081 aggqdmadsm lmqgsrgltd qaifyavtpl pwcphlvavc pipaagldvt qpcgdcgtiq
1141 enwvclscyq vycgryingh mlqhhgnsgh plvlsyidls awcyycqayv hhqalldvkn
1201 iahqnkfged mphph (SEQ ID:11)
```

FIG. 6A

FIG. 6B-1
FIG. 6B-2
FIG. 6B-3

FIG. 6B

```
  1 gggcagtccc ctgaggagcg gggctggttg aaacgctagg ggcgggatct ggcggagtgg
 61 aagaaccgcg gcaggggcca agcctcctca actatgacct caaccggcca ggattccacc
121 acaaccaggc agcgaagaag taggcagaac ccccagtcgc cccctcagga ctccagtgtc
181 acttcgaagc gaaatattaa aaagggagcc gttccccgct ctatccccaa tctagcggag
241 gtaaagaaga aaggcaaaat gaagaagctc ggccaagcaa tggaagaaga cctaatcgtg
301 ggactgcaag ggatggatct gaacctcgag gctgaagcac tggctggcac tggcttggtg
361 ttggatgagc agttaaatga attccattgc ctctgggatg acagcttccc ggaaggccct
421 gagcggctcc atgccatcaa ggagcaactg atccaggagg gcctcctaga tcgctgcgtg
481 tcctttcagg cccggtttgc tgaaaaggaa gagctgatgt tggttcacag cctagaatat
```

FIG. 6B-1

```
 541 attgacctga tggaaacaac ccagtacatg aatgagggag aactccgtgt cctagcagac
 601 acccacgact cagtttatct gcatccgaac tcatactcct gtgcctgcct ggcctcaggc
 661 tctgtcctca ggctggtgga tgcggtcctg gggctgaga tccggaacgg catggccatc
 721 attaggcctc ctggacatca cgcccagcac agtcttatgg atggctattg catgttcaac
 781 cacgtggctg tggcagcccg ctatgctcaa cagaaacacc gcacccggag ggtccttatc
 841 gtagattggg atgtgcacca cggtcaagga acacagttca ccttcgacca ggaccccagt
 901 gtcctctatt tctccatcca ccgctacgag cagggtaggt tctggcccca cctgaaggcc
 961 tctaactggt ccaccacagg tttcggccaa ggccaaggat ataccatcaa tgtgccttgg
1021 aaccaggtgg ggatgcggga tgctgactac attgctgctt tcctgcacgt cctgctgcca
1081 gtcgccctcg agctccagcc tcagctggtc ctggtggccg ctggatttga tgccctgcaa
1141 ggggacccca agggcgagat ggccgccact ccggcagggt tcgcccagct aacccacctg
1201 ctcatgggtc tggcaggagg caagctgatc ctgtctctgg agggtggcta caacctccgc
1261 gccctggctg aaggcgtcag tgcttcgctc cacacccttc tgggagaccc ttgccccatg
1321 ccggagtcac ctggtgcccc ctgccggagc gcccaggctt cagtttcctg tgctctggaa
1381 gcccttgagc ccttctggga ggttcttgtg agatcaactg agaccgtgga gagggacaac
1441 atggaggagg acaatgtaga ggagagcgag gaggaaggac cctgggagcc ccctgtgctc
1501 ccaatcctga calggccagt gctacagtct cgcacagggc tggtctatga ccaaaatatg
1561 atgaatcact gcaacttgtg ggacagccac caccctgagg taccccagcg catcttgcgg
1621 atcatgtgcc gtctggagga gctgggcctt gccgggcgct gcctcaccct gacaccgcgc
1681 cctgccacag aggctgagct gctcacctgt cacagtgctg agtacgtggg tcatctccgg
1741 gccacagaga aaatgaaaac ccgggagctg caccgtgaga gttccaactt tgactccatc
1801 tatatctgcc ccagtacctt cgcctgtgca cagcttgcca ctggcgctgc ctgccgcctg
1861 gtggaggctg tgctctcagg agaggtcctg aatggtgctg ctgtggtgcg tcccccagga
1921 caccacgcag agcaggatgc agcttgcggt tttigctttt tcaactctgt ggctgtggct
1981 gctcgccatg cccagactat cagtgggcat gccctacgga tcctgattgt ggattgggat
2041 gtccaccacg gtaatggaac tcagcacatg tttgaggatg accccagtgt gctatatgtg
2101 tccctgcacc gctatgatca tggcaccttc ttccccatgg gggatgaggg tgccagcagc
2161 cagatcggcc gggccgcggg cacaggcttc accgtcaacg tggcatggaa cgggccccgc
2221 atgggtgatg ctgactacct agctgcctgg catcgcctgg tgcttcccat tgcctacgag
2281 tttaacccag aactggtgct ggtctcagct ggctttgatg ctgcacgggg ggatccgctg
```

FIG. 6B-2

```
2341 gggggctgcc aggtgtcacc tgagggttat gcccacctca cccacctgct gatgggcctt
2401 gccagtggcc gcattatcct tatcctagag ggtggctata acctgacatc catctcagag
2461 tccatggctg cctgcactcg ctccctcctt ggagacccac cacccCtgct gaccctgcca
2521 cggcccccac tatcaggggc cctggcctca atcactgaga ccatccaagt ccatcgcaga
2581 tactggcgca gcttacgggt catgaaggca gaagacagag aaggaccctc cagttctaag
2641 ttggtcacca agaaggcacc ccaaccagcc aaacctaggt tagctgagcg gatgaccaca
2701 cgagaaaaga aggttctgga agcaggcatg gggaaagtca cctcggcatc atttggggaa
2761 gagtccactc caggccagac taactcagag acagctgtgg tggccctcac tcaggaccag
2821 ccctcagagg cagccacagg gggagccact ctggcccaga ccatttctga ggcagccatt
2881 gggggagcca tgctgggcca gaccacctca gaggaggctg tcgggggagc cactccggac
2941 cagaccacct cagaggagac tgtgggagga gccattctgg accagaccac ctcagaggat
3001 gctgttgggg gagccacgct gggccagact acctcagagg aggctgtagg aggagctaca
3061 ctggcccaga ccatctcgga ggcagccatg gagggagcca cactggacca gactacgtca
3121 gaggaggctc caggggggcac cgagctgatc caaactcctc tagcctcgag cacagaccac
3181 cagacccccc caacctcacc tgtgcaggga actacacccc agatatctcc cagtacactg
3241 attgggagtc tcaggacctt ggagctaggc agcgaacctC agggggcctc agaatctcag
3301 gccccaggag aggagaacct accaggagag gcagctggag gtcaggacat ggctgattcg
3361 atgctgacgc agggatctag gggcctcact gatcaggcca tattttatgc tgtgacacca
3421 ctgccctggt gtccccattc ggtggcagta tgccccatac ctgcagcagg cctagacgtg
3481 acccaacctt gtggggactg tggaacaatc caagagaact gggtgtgtct ctcttgctat
3541 caggtctacc gtggtcgtta catcaatggc cacatgctcc aacaccatgg aaattctgga
3601 cacccgctgg tcctcagcca catcgacctg tcagcctggc gttactactg tcaggcctat
3661 gtccaccacc aggctctcct agatgtgaag aacatcgccc accagaacaa gtttggggag
3721 gatatgcccc acccacacta agccccagaa tacggtccct cttcaccttc tgaggcccac
3781 gatagaccag ttccagcctg ttccaggctg taccttggat gaggggtagc ctcccactgc
3841 atcccatcct gaatatcctt tgcaactccc caagagtgct tatttaagtg ttaatacttt
3901 taagagaact gcgacgatta attgtggatc tccccctgcc catcgcccgc ttgaggggca
3961 ccactactcc agcccagaag gaaagggggg cagctcagtg gccccaagag ggagccgata
4021 tcatgaggat aacattggcg ggaggggagt taactggcag gcatggcaag gttgcatatg
4081 taataaagta caagctgtt (SEQ ID NO: 12)
```

FIG. 6B-3

```
  1 mdlrvgqrpp vepppeptll alqrpqrlhh hlflaglqqq rsvepmrlsm dtpmpelqvg
 61 pqeqelrqll hkdkskrsav assvvkqkla evilkkqqaa lertvhpnsp gipyrtlepi
121 etegatrsml ssflppvpsi psdppehfpl rktvsepnlk lrykpkksle rrknpllrke
181 sappslrrrp aetlgdssps ssstpasgcs spndsehgpn pilgdsdrrt hptlgprgpi
241 lgsphtplfl phglepeagg clpsrlqpil lldpsgshap lltvpglgpl pfhfaqsimt
301 terlsgsglh wplsrtrsep lppsatappp pgpmqprleq lkthvqvikr sakpsekprl
361 rqipsaedle tdgggpgqvv ddglehrelg hgqpeargpa plqqhpqvii weqqrlagrl
421 prgstgdcvi lplaqgghrp lsraqsspaa pasisapepa sqarvlssse tpartlpflt
481 gliydsvmlk hqcscgdnsr hpehagriqs iwsrlqergl rsqceclrgr kasieelqsv
541 hserhvllyg tnplsrlkld ngklagiiaq rmfemlpcgg vgvdtdtiwn elhssnaarw
601 aagsvtdlaf kvasrelkng favvrppghh adhstamgfc ffnsvaiacr qlqqqskask
661 askilivdwd vhhgngtqqt fyqdpsvlyi slhrhddgnf fpgsgavdev gagsgegfnv
721 nvawaggldp pmgdpeylaa frivvmpiar efspdlvlvs agfdaaeghp aplggyhvsa
781 kcfgymtqql mnlaggavvl alegghdlta icdaseacva allgnrvdpl seegwkqkpq
841 pqchplsggr dpgaq (SEQ ID NO:13)
```

FIG. 7A

FIG. 7B-1
FIG. 7B-2

FIG. 7B

```
   1 ataatacct a ccttgcagga ccacgacagg attaagtgag gaaaaacccc catgagagtg
  61 ttttgccatt gtcaagtgag cctgagggag gctgaggggg gatcaggctg tatcatgccc
 121 ccgaggacaa actttccagt ttaccctgct ccctctctct gtccctaggc tgccccaggc
 181 cctgcgcaga cacaccaggc cctcagccgc agcccatgga cctgcgggtg ggccagcggc
 241 ccccagtgga gcccccacca gagcccacat tgctggccct gcagcgtccc cagcgcctgc
 301 accaccacct cttcctagca ggcctgcagc agcagcgctc ggtggagccc atgaggctct
 361 ccatggacac gccgacgccc gagttgcagg tgggacccca ggaacaagag ctgcggcagc
 421 ttctccacaa ggacaagagc aagcgaagtg ctgtagccag cagcgtggtc aagcagaagc
 481 tagcggaggt gattctgaaa aaacagcagg cggccctaga aagaacagtc catcccaaca
 541 gccccggcat tccctacaga accccggagc ccctggagac ggaaggagcc acccgctcca
 601 tgctcagcag ccttccgcct cctgctccca gcccgcccag tgacccccca gagcactccc
 661 ctctgcgcaa gacagtctct gagcccaacc tgaagctgcg ccataagccc aagaagtccc
 721 cggagcggag gaagaatcca ctgctccgaa aggagagtgc gccccccagc ccccggcggc
 781 ggcccgcaga gaccctcgga gactcctccc caagtagtag cagcacgccc gcatcagggt
 841 gcagtccccc caatgacagc gagcacggcc ccaatcccat cctgggcgac agtgaccgca
 901 ggacccatcc gactctgggc cccgggggc caatcctggg gagcccccac actcccctct
 961 tcctgcccca tggcttggag cccgaggctg gggcacctt gccctcccgc ctgcagccca
1021 ttcctctcct ggacccctca ggctctcatg ccccgctgct gactgtgccc gggcttgggc
1081 ccttgccctt ccactttgcc cagtccttaa tgaccaccga gcggctctct gggtcaggcc
1141 tccactggcc actgagccgg actcgctcag agcccctgcc ccccagtgcc accgctcccc
1201 caccgccggg ccccatgcag ccccgcctgg agcagctcaa aactcacgtc caggtgatca
1261 agaggtcagc caagccgagt gagaagcccc ggctgcggca gataccctcg gctgaagacc
1321 tggagacaga tggcggggga ccgggccagg tggtggacga cggcccggag cacagggagc
```

FIG. 7B-1

1381 tgggccatgg gcagcccgag gccagaggcc ccgctcctct ccagcagcac cctcaggtgt
1441 tgctctggga acagcagcga ctggctgggc ggctcccccg gggcagcacc ggggacactg
1501 tgctgcttcc tctggcccag ggtgggcacc ggcctctgtc ccgggctcag tcttccccag
1561 ccgcacctgc ctcactgtca gccccagagc ctgccagcca ggcccgagtc ctctccagct
1621 cagagacccc tgccaggacc ctgcccttca ccacagggct gatctatgac tcggtcatgc
1681 tgaagcacca gtgctcctgc ggtgacaaca gcaggcaccc ggagcacgcc ggccgcatcc
1741 agagcatctg gtcccggctg caggagcggg ggcctcggag ccagtgtgag tgtctccgag
1801 gccggaaggc ctccctggaa gagctgcagt cggtccactc tgagcggcac gtgctcctct
1861 acggcaccaa cccgctcagc cgcctcaaac tggacaacgg gaagctggca gggctcctgg
1921 cacagcggat gtttgagatg ctgccctgtg gtggggttgg ggtggacact gacaccatct
1981 ggaatgagct tcattccLcc aatgcagccc gctgggccgc tggcagtgtc actgacctcg
2041 ccttcaaagt ggcttctcgt gagctaaaga atggtttcgc tgtggtgcgg cccccaggac
2101 accatgcaga tcattcaaca gccatgggct tctgcttctt caactcagtg gccatcgcct
2161 gccggcagct gcaacagcag agcaaggcca gcaaggccag caagatcctc attgtagact
2221 gggacgtgca ccatggcaac ggcacccagc aaaccttcta ccaagacccc agtgtgctct
2281 acatctccct gcatcgccat gacgacggca acttcttccc ggggagtggg gctgtggatg
2341 aggtaggggc tggcagcggt gagggcttca atgtcaatgt ggcctgggct ggaggtctgg
2401 acccccccat gggggatcct gagtacctgg ctgctttcag gatagtcgtg acgcccatcg
2461 cccgagagtt ctctccagac ctagtcctgg tgtctgccgg atttgatgct gctgagggtc
2521 acccggcccc acLgggtggc taccatgttt ctgccaaatg ttttggatac atgacgcagc
2581 aactgatgaa cctggcagga ggcgcagtgg tgctggcctt ggagggtggc catgacctca
2641 cagccatctg tgacgcctct gaggcctgtg tggctgctct tctgggtaac agggtggatc
2701 ccctttcaga agaaggctgg aaacagaaac cccaacctca atgccactcg ctctctggag
2761 gccgtgatcc gggtgcacag taaatactgg ggctgcatgc agcgcctggc ctcctgtcca
2821 gactcctggg tgcctagagt gccaggggct gacaaagaag aagtggaggc agtgaccgca
2881 ctggcgtccc tctctgtggg catcctggct gaagataggc cctcggagca gctggtggag
2941 gaggaagaac ctatgaatct ctaaggctct ggaaccatct gcccgcccac catgcccttg
3001 ggacctggtt ctcttctaac ccctggcaat agcccccatt cctgggtctt tagagatcct
3061 gtgggcaagt agttggaacc agagaacagc ctgcctgctt tgacagttat cccagggagc
3121 gtgagaaaat c (SEQ ID NO:14)

FIG. 7B-2

```
  1 meepeepads gqslvpvyiy speyvsmcds lakipkrasm vhslieayal hkqmrivkpk
 61 vasmeematf htdaylqhlq kvsqegdddh pdsieyglgy dcpategifd yaaaiggati
121 taaqclidgm ckvainwsgg whhakkdeas gfcylndavl gilrlrrkfe rilyvdldlh
181 hgdgvedafs ftskvmtvsl hkfspgffpg tgdvsdvglg kgryysvnvp iqdgiqdeky
241 yqicesvlke vyqafnpkav vlqlgadtia gdpmcsfnmt pvgigkclky ilqwqlatli
301 lggggynlan tarcwtyltg vilgktlsse ipdbefftay gpdyvleitp scrpdrneph
361 riqqilnyik gnlkhvv (SEQ ID NO:15)
```

FIG. 8A

```
   1 gaaattcggc acgagctcgt gccgaattcg gcacgagaac ggttttaagc ggaagatgga
  61 ggagccggag gaaccggcgg acagtgggca gtcgctggtc ccggtttata tctatagtcc
 121 cgagtatgtc agtatgtgtg actccctggc caagatcccc aaacgggcca gtatggtgca
 181 ttctttgatt gaagcatatg cactgcataa gcaaatgagg atagttaagc ctaaagtggc
 241 ctccatggag gagatggcca ccttccacac tgatgcttat ctgcagcatc tccagaaggt
 301 cagccaagag ggcgatgatg atcatccgga ctccatagaa tatgggctag gttatgactg
 361 cccagccact gaagggatat ttgactatgc agcagctata ggaggggcta cgatcacagc
 421 tgcccaatgc ctgattgacg gaatgtgcaa agtagcaatc aactggtctg gagggtggca
 481 tcatgcaaag aaagatgaag catctggttt tcgttatctc aatgatgctg tcctgggaat
 541 attacgattg cgacggaaat ttgagcgtat tccctacgtg gattcggatc tgcaccatgg
 601 agatggtgta gaagacgcat tcagtttcac ctccaaagtc atgaccgtgt ccctgcacaa
 661 attctcccca ggatttttcc caggaacagg tgacgtgtcc gacgttggcc tagggaaggg
 721 acggtactac agtgtaaatg tgcccatcca ggatggcata caagatgaaa aatattacca
 781 gatctgcgaa agtgtactaa aggaagtata ccaagccttt aatcccaaag cagtggtctt
 841 acagctggga gccgacacaa tagctgggga tcccatgtgc tcctttaaca tgactccagt
 901 gggaattggc aagtgtctca agtacatccc tcaatggcag ttggcaacac tcatttcggg
 961 aggaggaggc tataaccttg ccaacacggc tcgatgctgg acatacttga ccggggtcat
1021 cctagggaaa acactatcct ctgagatccc agatcatgag tttttcacag catatggtcc
1081 tgattatgtg ctggaaatca cgccaagctg ccggccagac cgcaatgagc cccaccgaat
1141 ccaacaaatc ctcaactaca tcaaagggaa tctgaagcat gtggtctagt tgacagaaag
1201 agatcaggtt tccagagctg aggagtggtg cctataatga agacagcgtg tttatgcaag
1261 cagtttgrgg aatttgtgac tgcagggaaa atttgaaaga aattacttcc tgaaaatttc
1321 caaggggcat caagtggcag ctggcttcct ggggtgaaga ggcaggcacc ccagagtcct
1381 caactggacc taggggaaga aggagatarc ccacatttaa agttcttatt taaaaaaaca
1441 cacacacaca aatgaaattt ttaatctttg aaaattattt ttaagcgaat tggggagggg
1501 agtattttaa tcatcttaaa tgaaacagat cagaagctgg atgagagcag tcaccagttt
1561 gtagggcagg aggcagctga caggcagggn tngggcctcn ggaccancca ngtggagccc
1621 tgggagagan ggtactgatc ngcagactgg gagg (SEQ ID NO:16)
```

FIG. 8B

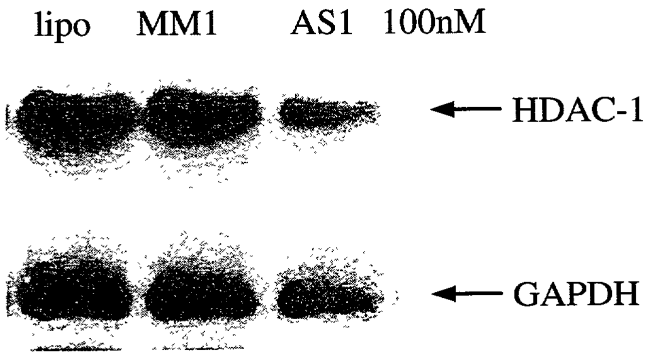

lipo
MM1
AS1
100nM
HDAC-1
GAPDH

FIG. 9A

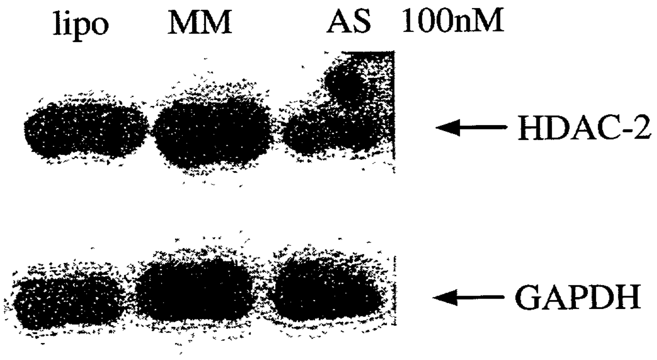

lipo
MM
AS
100nM
HDAC-2
GAPDH

FIG. 9B

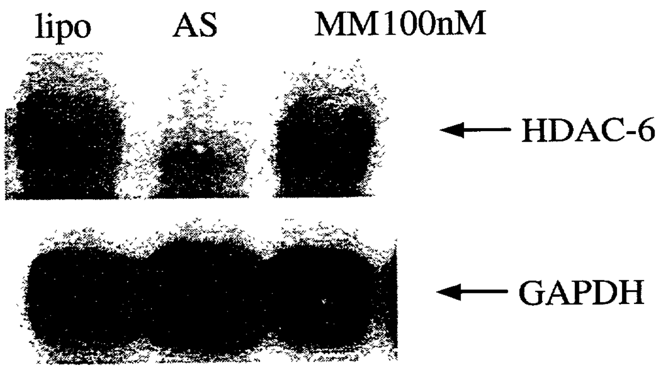

lipo
AS
MM100nM
HDAC-6
GAPDH

FIG. 9C

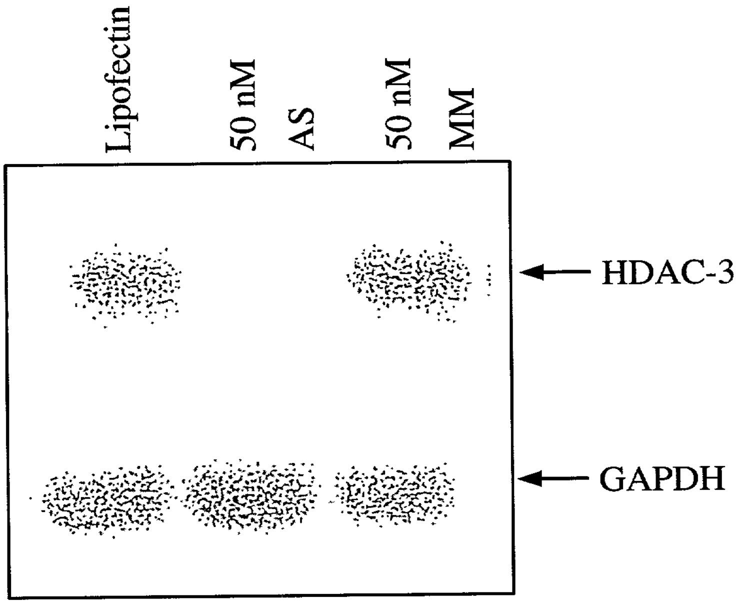

Lipofectin
50 nM
AS
50 nM
MM
HDAC-3
GAPDH

FIG. 9D

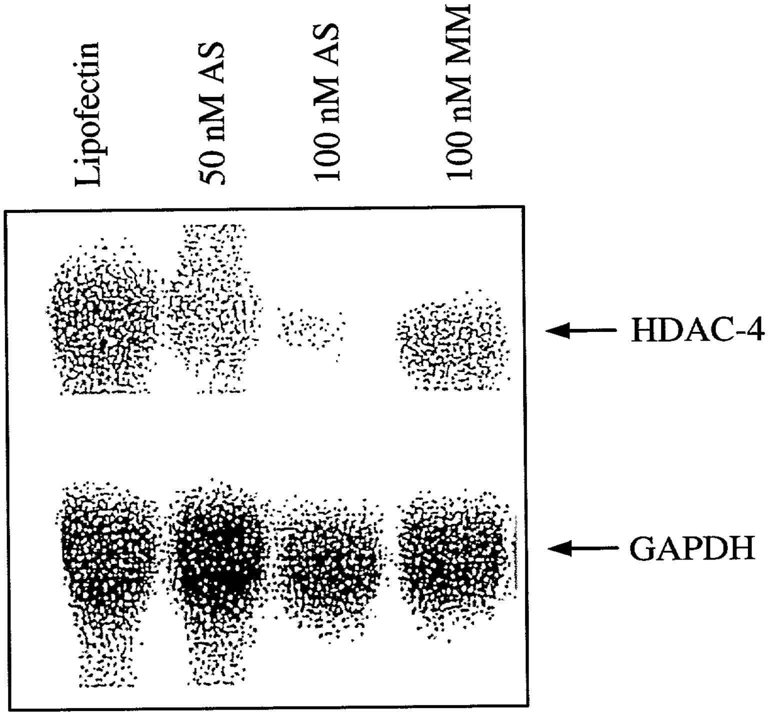

Lipofectin
50 nM AS
100 nM AS
100 nM MM
HDAC-4
GAPDH

FIG. 9E

10052470.071802

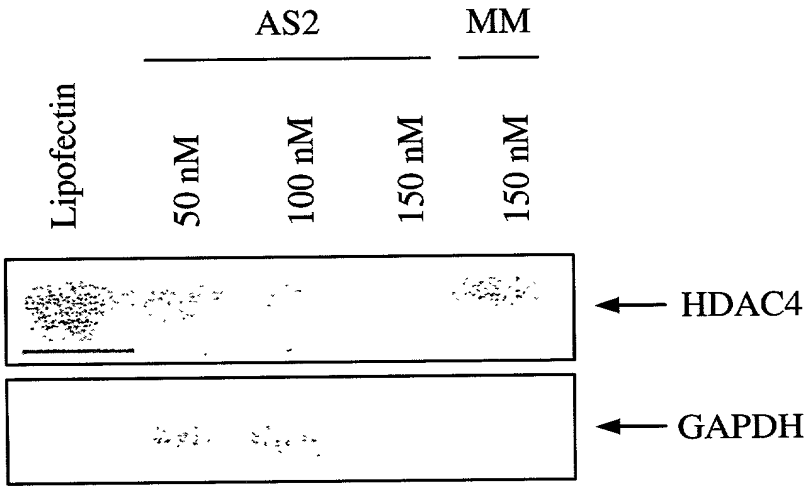

AS2
MM
Lipofectin
50 nM
100 nM
150 nM
150 nM
HDAC4
GAPDH

FIG. 9F

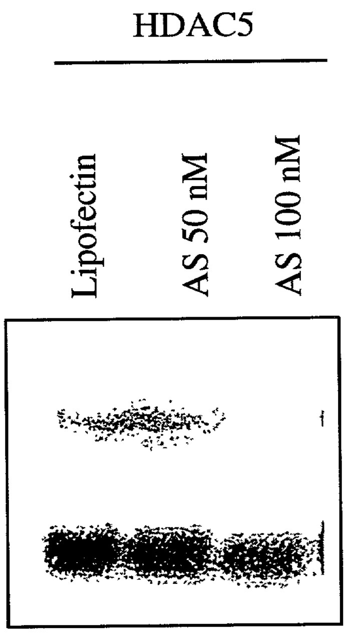

HDAC5
Lipofectin
AS 50 nM
AS 100 nM

FIG. 9G

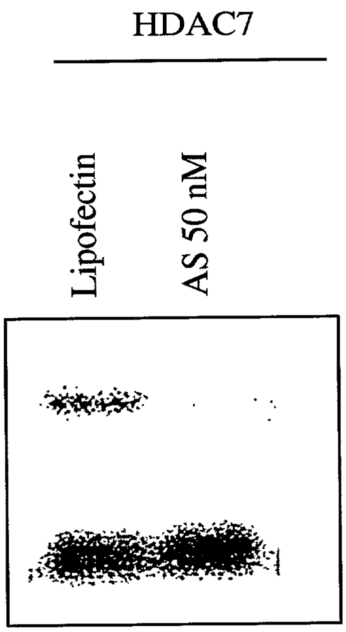

HDAC7
Lipofectin
AS 50 nM

FIG. 9H

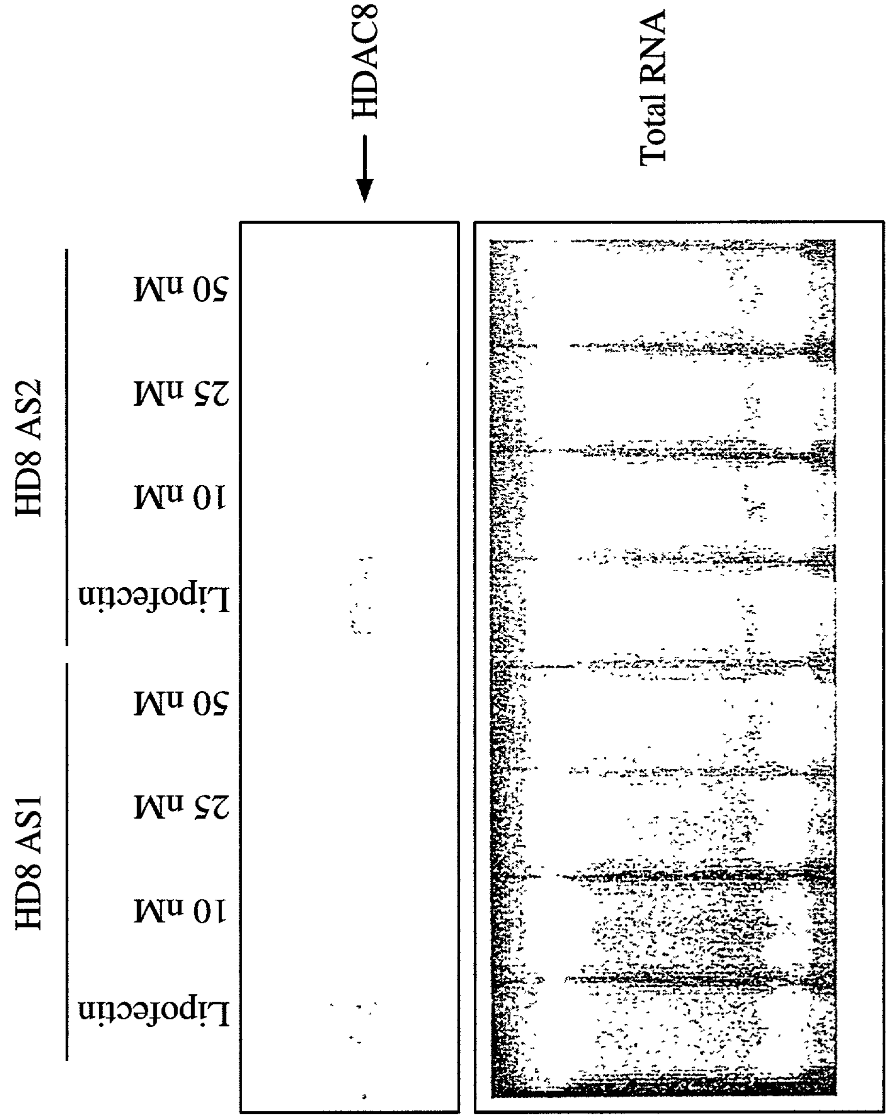
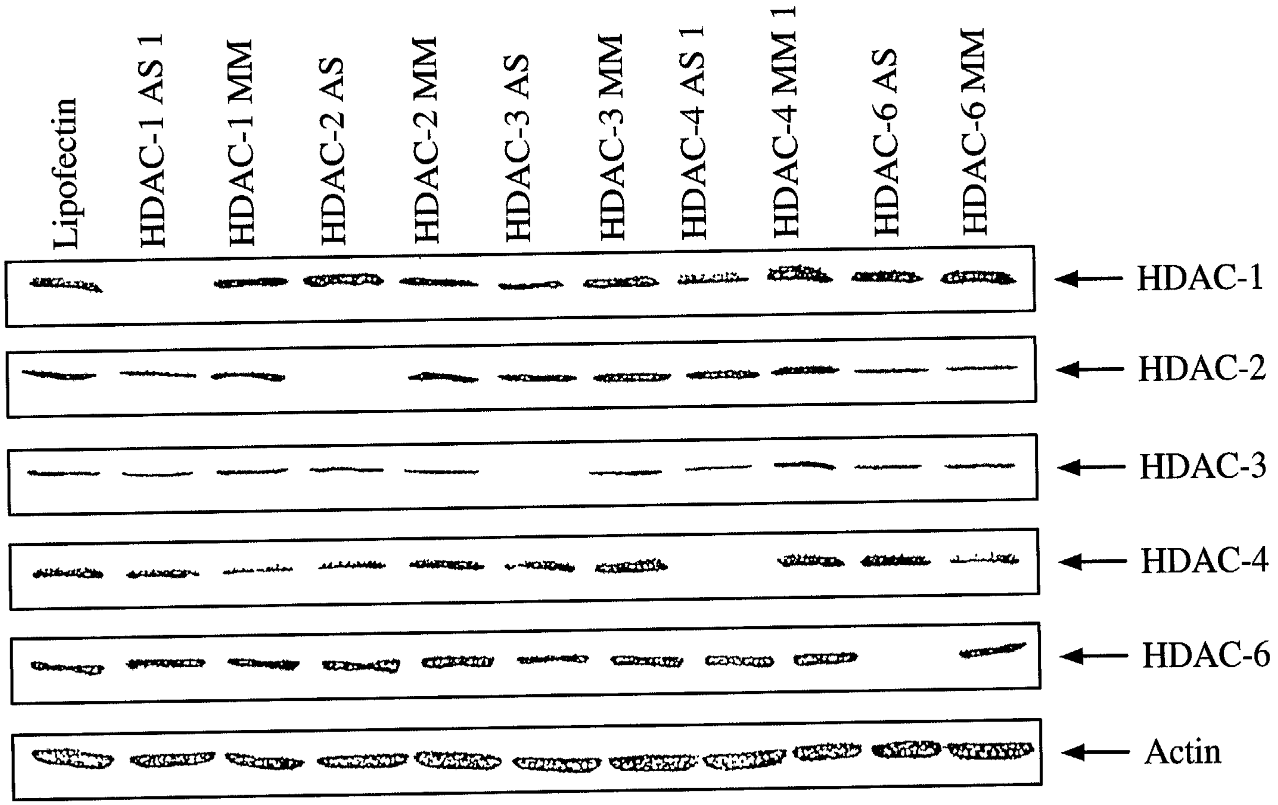

HD8 AS1
HD8 AS2
Lipofectin
10 nM
25 nM
50 nM
Lipofectin
10 nM
25 nM
50 nM
HDAC8
Total RNA

FIG. 9I


Lipofectin
HDAC-1 AS 1
HDAC-1 MM
HDAC-2 AS
HDAC-2 MM
HDAC-3 AS
HDAC-3 MM
HDAC-4 AS 1
HDAC-4 MM 1
HDAC-6 AS
HDAC-6 MM
HDAC-1
HDAC-2
HDAC-3
HDAC-4
HDAC-6
Actin

AS = Antisense
MM = Mismatch
NS = Non-specific control
3 day treatment
Oligonucleotide cone – 50nM

FIG. 10A

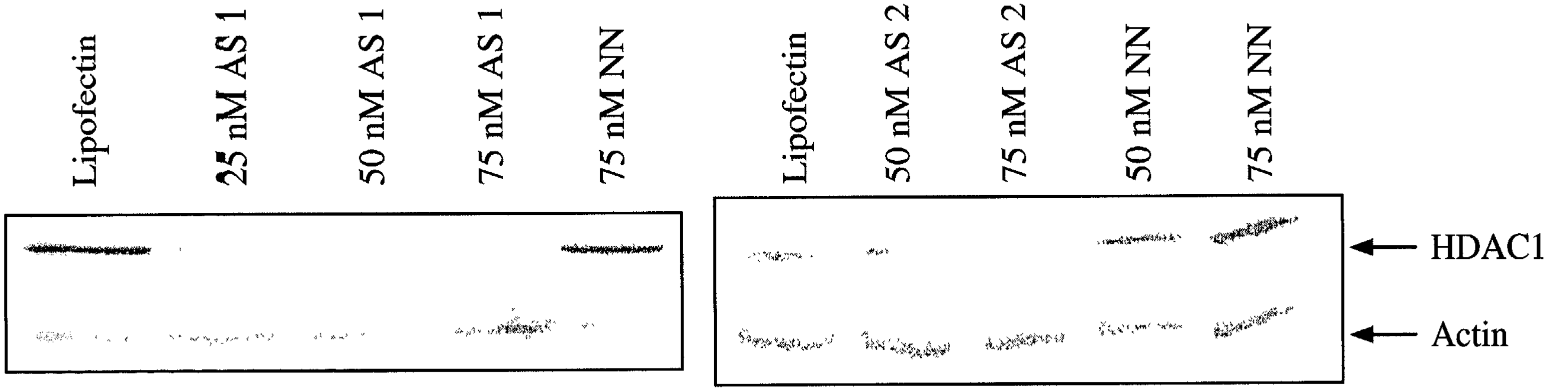

Lipofectin
25 nM AS 1
50 nM AS 1
75 nM AS 1
75 nM NN
Lipofectin
50 nM AS 2
75 nM AS 2
50 nM NN
75 nM NN
HDAC1
Actin

FIG. 10B

09817913.043001

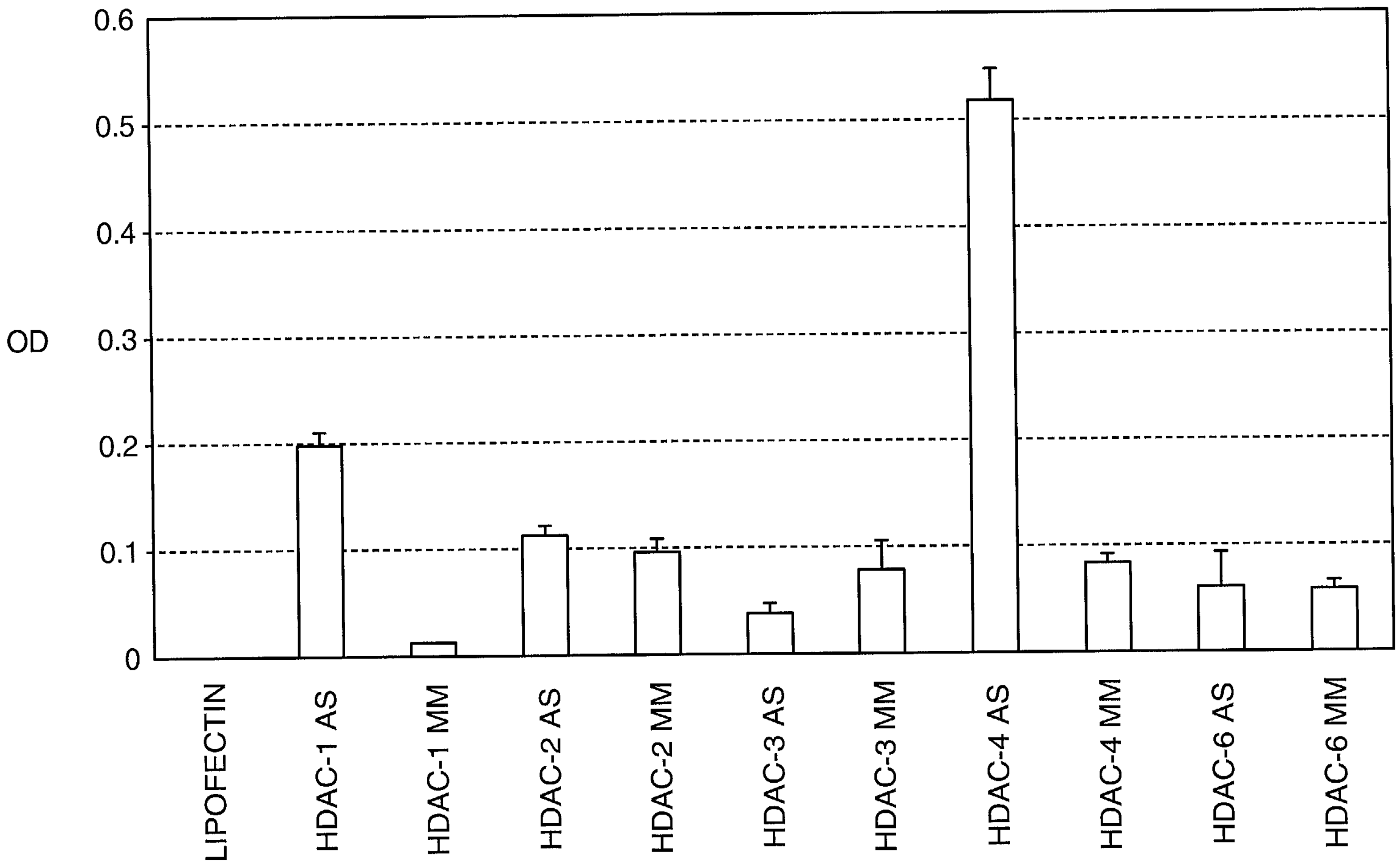


FIG. 11

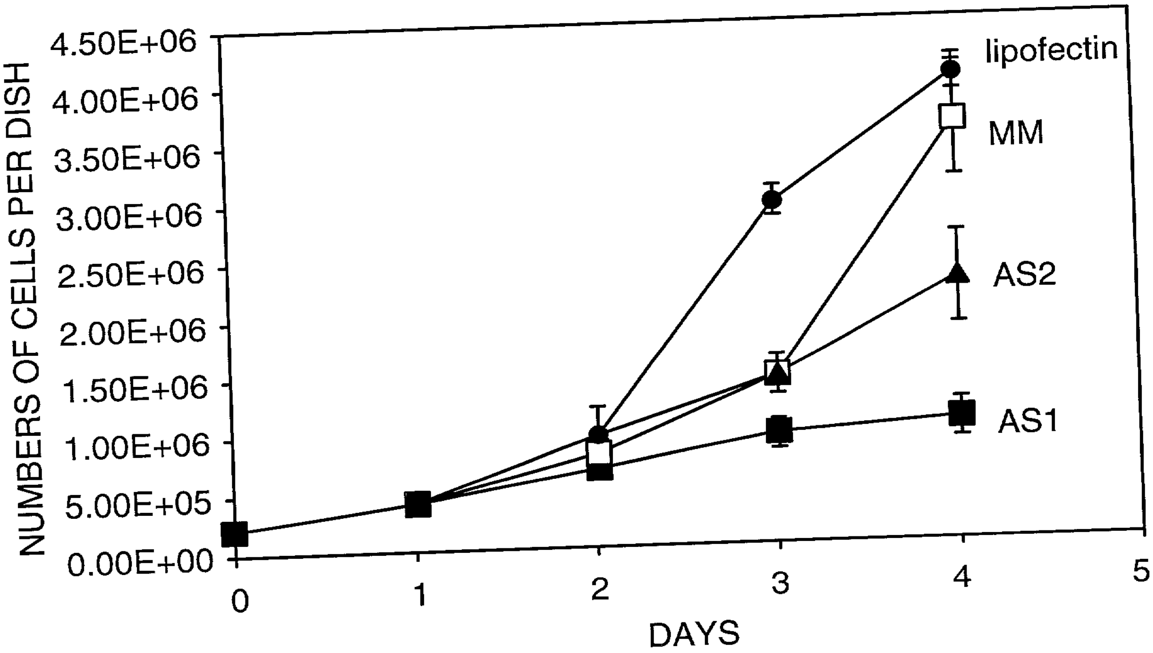


FIG. 12A

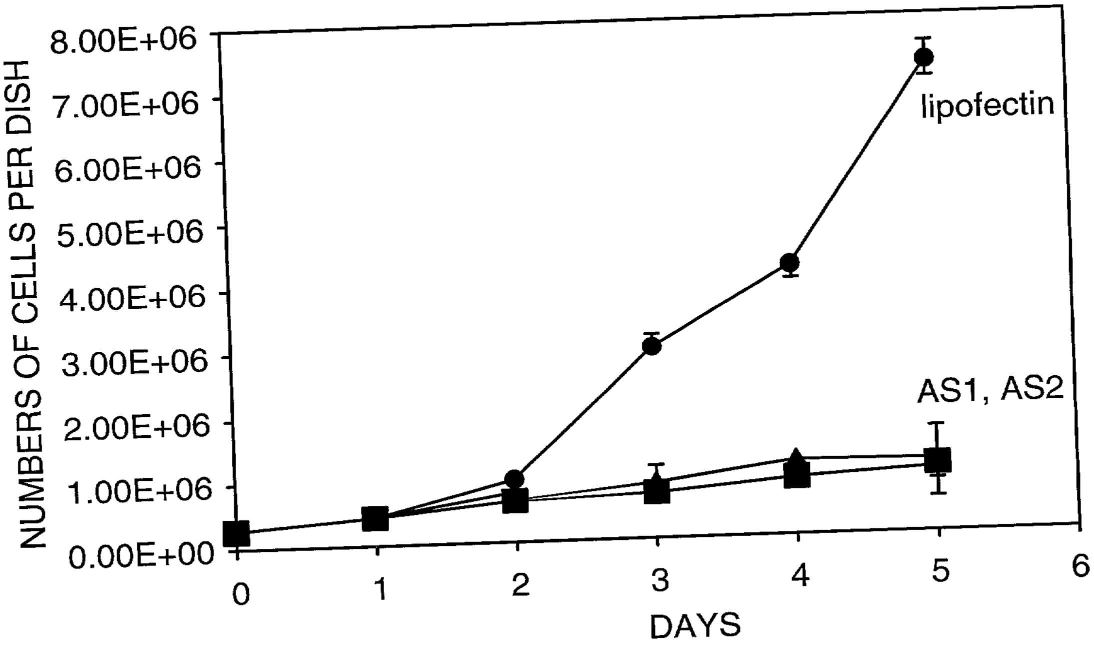


FIG. 12B

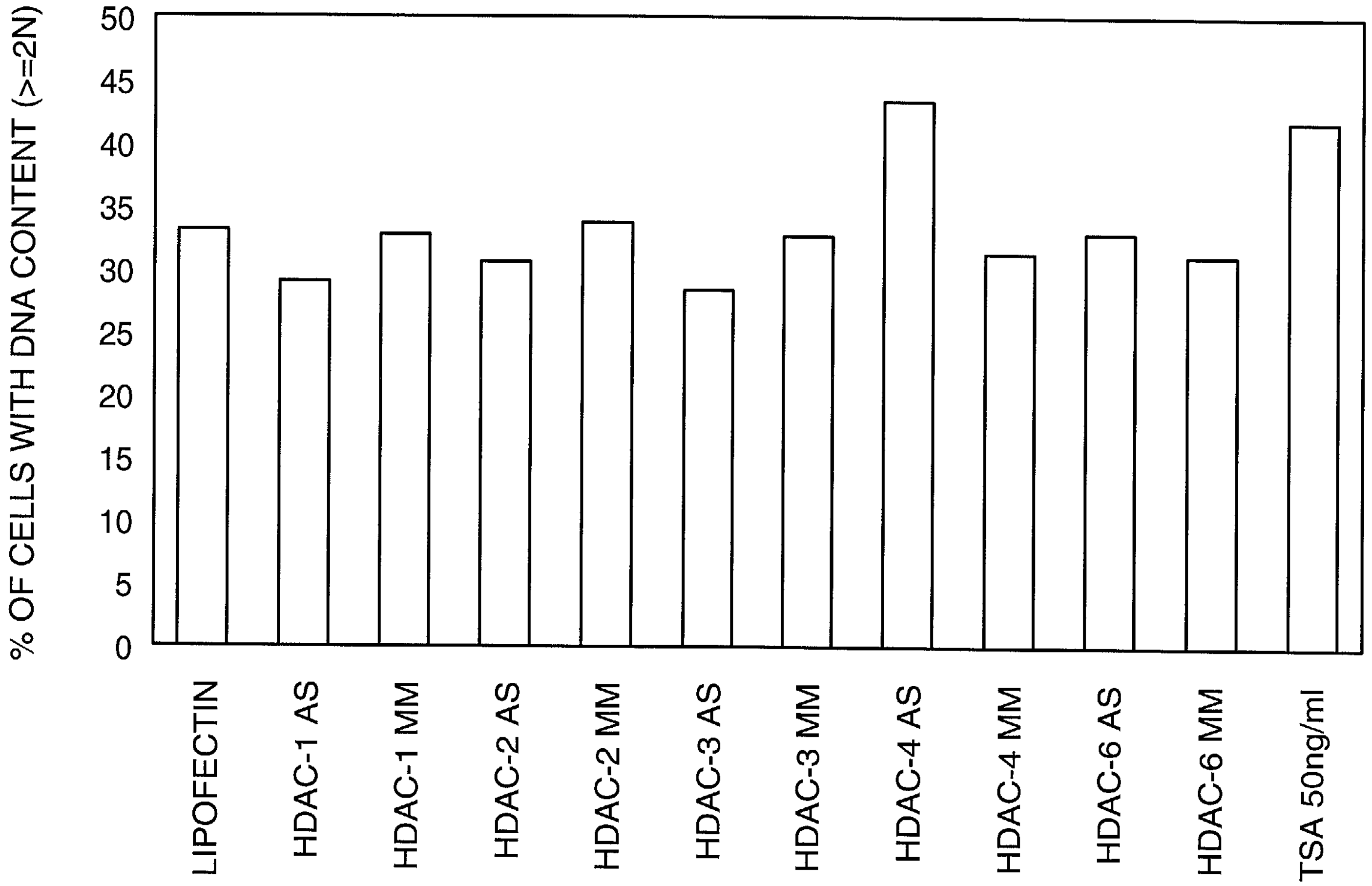

% OF CELLS WITH DNA CONTENT (>=2N)
0
5
10
15
20
25
30
35
40
45
50
LIPOFECTIN
HDAC-1 AS
HDAC-1 MM
HDAC-2 AS
HDAC-2 MM
HDAC-3 AS
HDAC-3 MM
HDAC-4 AS
HDAC-4 MM
HDAC-6 AS
HDAC-6 MM
TSA 50ng/ml

FIG. 13

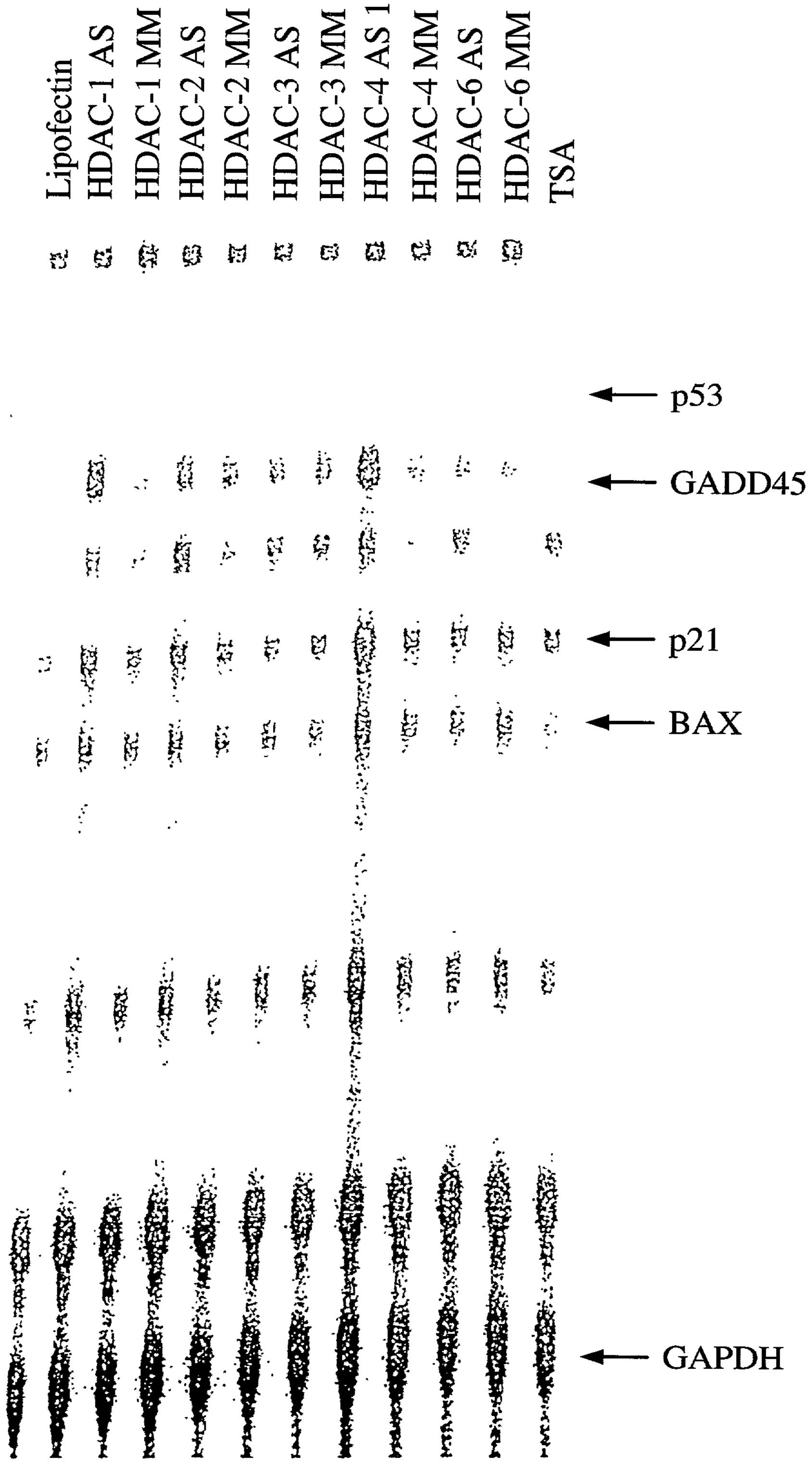

Lipofectin
HDAC-1 AS
HDAC-1 MM
HDAC-2 AS
HDAC-2 MM
HDAC-3 AS
HDAC-3 MM
HDAC-4 AS 1
HDAC-4 MM
HDAC-6 AS
HDAC-6 MM
TSA
p53
GADD45
p21
BAX
GAPDH

FIG. 14

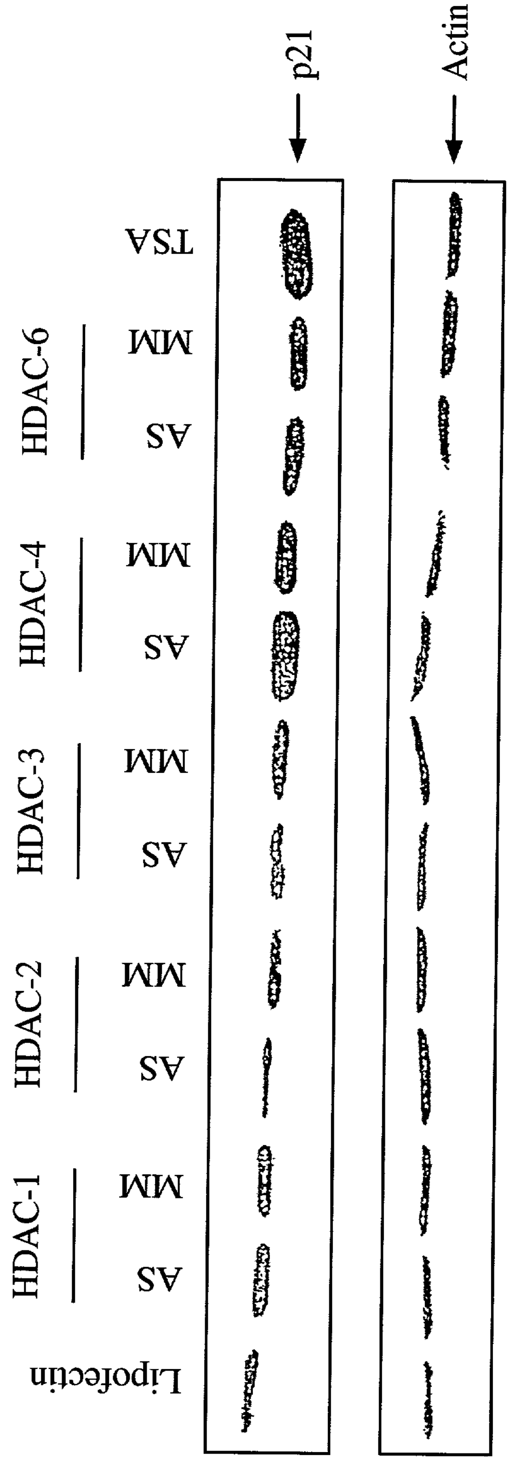

Lipofectin
HDAC-1
AS
MM
HDAC-2
AS
MM
HDAC-3
AS
MM
HDAC-4
AS
MM
HDAC-6
AS
MM
TSA
p21
Actin

FIG. 15

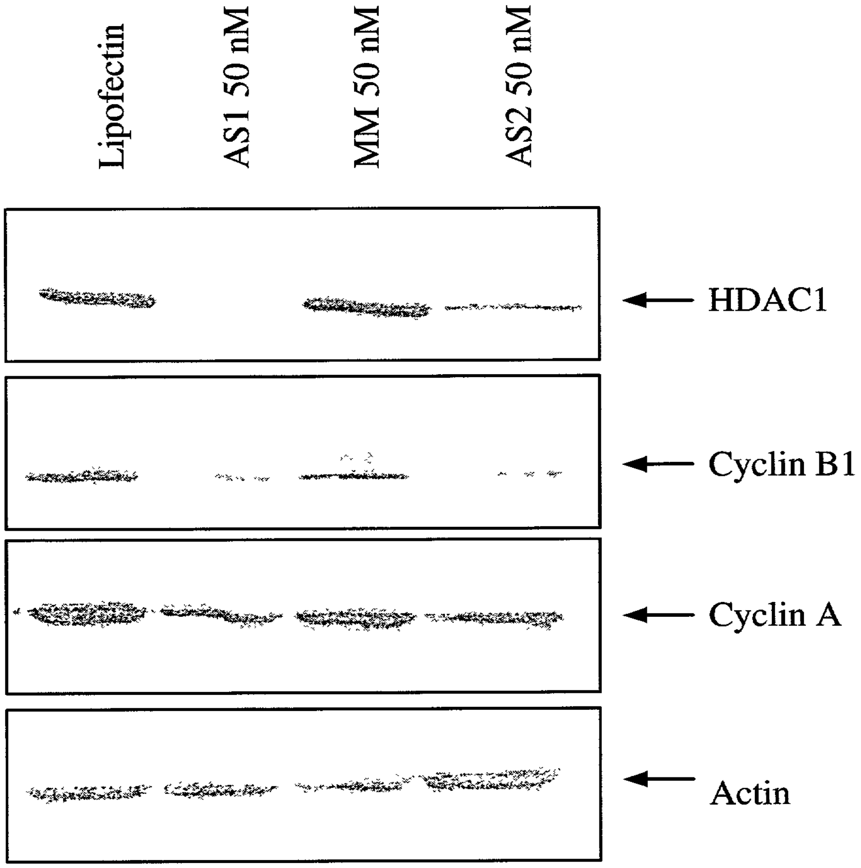

Lipofectin
AS1 50 nM
MM 50 nM
AS2 50 nM
HDAC1
Cyclin B1
Cyclin A
Actin

FIG. 16

09812913.043001

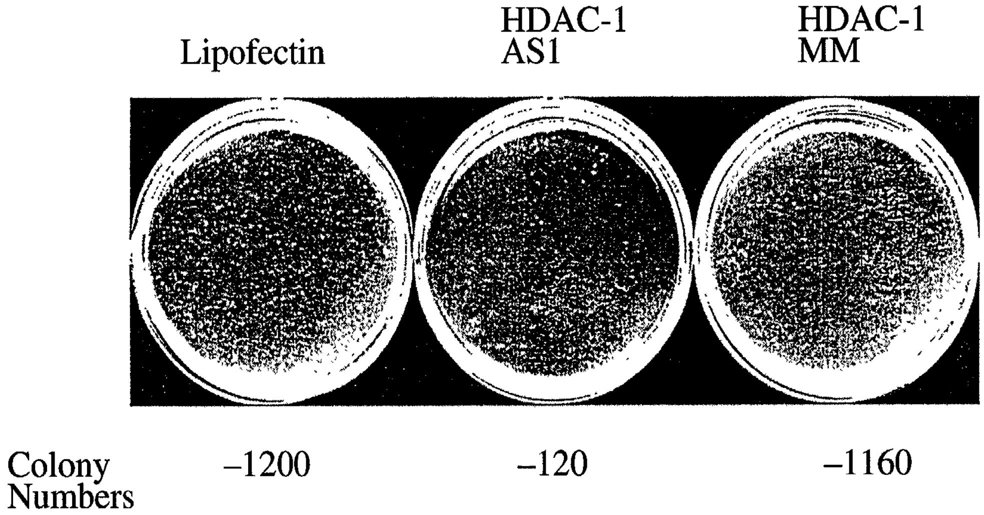

Lipofectin
HDAC-1 AS1
HDAC-1 MM
Colony Numbers
–1200
–120
–1160

FIG. 17A

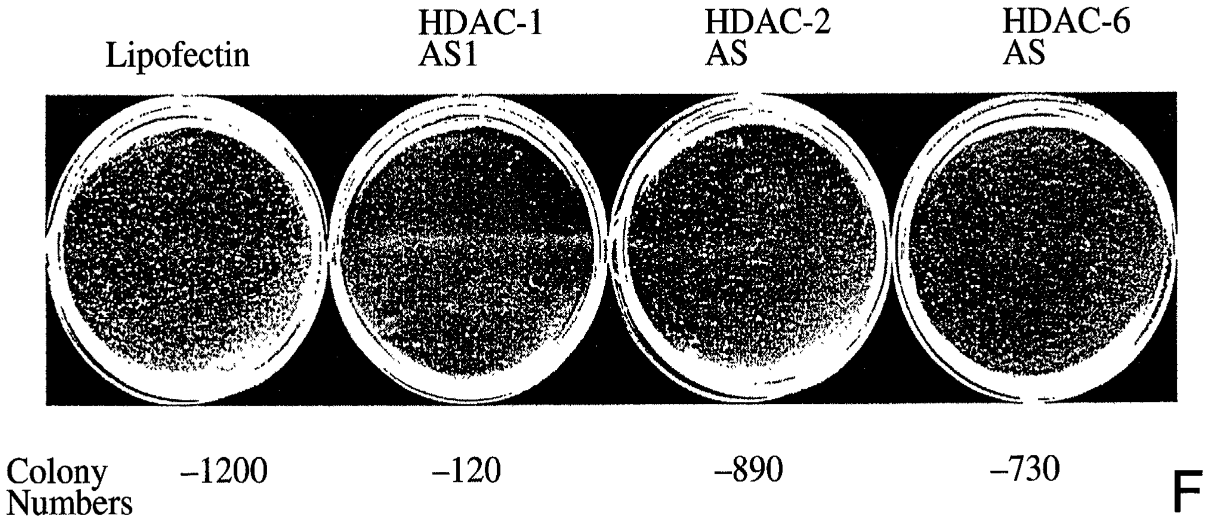

Lipofectin
HDAC-1 AS1
HDAC-2 AS
HDAC-6 AS
Colony Numbers
–1200
–120
–890
–730

FIG. 17B

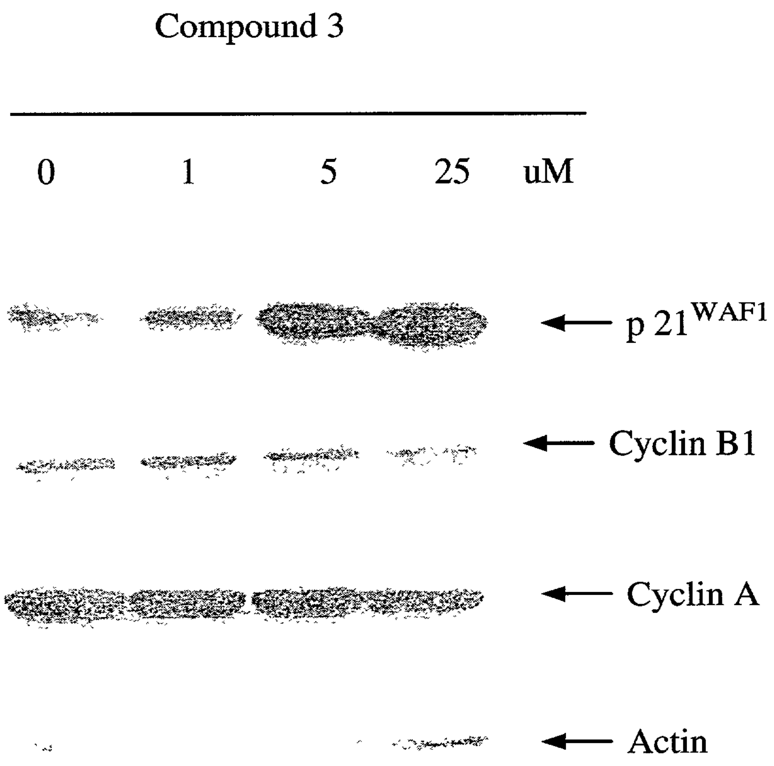

Compound 3
0
1
5
25
uM
p 21WAF1
Cyclin B1
Cyclin A
Actin

FIG. 18

09817913.043001